ILECs, and competitors would have to agree on vast amounts of cost data. Moreover, the end result of any such approach would not benefit consumers, but rather would delay implementation of truly efficient pricing.

The proposals of AT&T and others confirm the gargantuan size of the task that would arise out of a prescriptive approach. AT&T 20-29. Far from being "manageable," AT&T's proposal would involve extensive Commission review of cost studies and a reinitialization process that amounts to a reopening of the price cap implementation proceedings. And, after that process is complete, the Commission would have to commence a new proceeding to determine the proper "metrics" for determining whether and when price cap regulation should be removed. *Id.* at 86-87.

Clearly, such burdens are entirely unwarranted and will only produce further market distortions that will skew competitive entry and deprive consumers of competitive benefits. *See* Ameritech 48-50; BellSouth 40-42. Any prescriptive model, by definition, will be inflexible and prevent ILECs from responding to the dynamics of the increasingly competitive access services market. *See* BellSouth 15-16, 40-42. Such an outcome contravenes the procompetitive and deregulatory purpose of the 1996 Act by substituting the judgment of regulators for the actions of the marketplace. Ameritech 50; USTA 11-13.

---

micromanagement").

VI. CONCLUSION

For the foregoing reasons, and those given in GTE's opening comments, the FCC should adopt GTE's proposal for access reform as outlined herein. GTE's plan strikes the appropriate balance among the goals of promoting competition, efficient pricing and competitively neutral cost recovery.

Respectfully submitted,

GTE SERVICE CORPORATION,
on behalf of its affiliated local exchange
and interexchange telephone companies

R. Michael Senkowski
Jeffrey S. Linder
Gregory J. Vogt
WILEY, REIN & FIELDING
1776 K Street, N.W.
Washington, D.C. 20006
(202) 429-7000

Ward W. Wueste
Gail L. Polivy
1850 M Street, N.W.
Suite 1200
Washington, D.C. 20036
(202) 463-5200

Its Attorneys

February 14, 1997

APPENDIX A

NATIONAL ECONOMIC
RESEARCH ASSOCIATES
ONE MAIN STREET, CAMBRIDGE, MASSACHUSETTS 02142
TEL: *617.621.0444* FAX: *617.621.0336*

nera
Consulting Economists

REPLY TO KRAVTIN/SELWYN ANALYSIS OF THE GAP BETWEEN EMBEDDED AND FORWARD-LOOKING COSTS

Affidavit of Timothy J. Tardiff

Prepared for GTE

February 14, 1997

I. INTRODUCTION

The Kravtin/Selwyn (ETI) report starts with the *assumption* that historical (book) costs exceed forward-looking costs and then proceeds to "explain" this alleged gap. In the process, the authors assemble a long list of seemingly large estimates of costs deemed to be uneconomic and revenues supposedly available to offset future incumbent local exchange carrier (ILEC) losses from either erosion of market share in their current markets and/or reduction in the contribution from services currently priced above costs—in particular carrier access.

The facts and figures contained in the ETI report are irrelevant to determining whether a gap between forward-looking and historical costs exists; in many cases the report is misleading; and is often inconsistent with positions taken by the authors and/or their client (AT&T) in other proceedings. In essence, none of their analyses address the fundamental determinant of whether a gap between prices based on forward-looking costs and current levels exist—namely whether previous policies coupled with the changes in the Telecommunications Act have fundamentally altered the legitimate expectations of investors at the time they provided the funds that produced the current plant. The following sections discuss the major flaws in the analyses used to allege that certain existing costs are unjustifiably uneconomic and that new economic opportunities available to the ILECs outweigh the sure losses that would occur if carrier access prices were set as low as AT&T wants and no offsetting rate rebalancing were undertaken.

II. ETI'S ANALYSIS OF EMBEDDED INVESTMENT IS FUNDAMENTALLY IRRELEVANT, INCONSISTENT WITH PREVIOUS POSITIONS, AND SERIOUSLY FLAWED

The ETI report describes three calculations: (1) the proportion of current net plant that was installed after 1990, (2) the same calculation for certain "low tech" components of the network, and (3) an analysis of alleged growth in excess spare capacity.

The authors offer an unrealistic viewpoint that provides no meaningful guidance for how to handle the impacts of changing the current access charge regime. In ETI's world,

regulators are free to devalue ILECs' assets for the purpose of lowering prices to the ILEC's largest customers/competitors whenever (1) the investment was incurred after price regulation replaced traditional cost-based regulation or (2) the ILEC was serving demand beyond the bare minimum of basic service (presumably nothing more than a single line of POTs service to residential customers and the most rudimentary service to business customers). Further, even though prices and other terms (e.g., quality standards and obligation-to-serve) are still pervasively regulated, the ETI report would allow regulators to reduce prices with impunity, especially for the ILEC's non-basic services and doubly so when such services are provisioned with advanced technology.

This view of the world ignores the facts that (1) the regulatory bargain (under price caps as well as rate of return) calls for the establishment of prices that provide investors a legitimate opportunity to earn a return on and of their capital and (2) in the process of keeping prices low, regulators have established depreciation lives such that the book value of embedded plant may exceed its forward-looking economic value. *These* are the reasons for any gap between book costs and economic costs. Further, these reasons apply irrespective of whether the assets in question are old or new, technologically advanced or more mundane, etc. Neither knowledge of the vintage of the plant nor its technological composition have anything to contribute to sound public policy or good economics.

Apart from the fundamental irrelevance of ETI's calculations, the report also displays considerable misunderstanding of both telecommunications costs and the determinants of demand for telecommunications services. With regard to the former, ETI overlooks or ignores the facts that (1) telecommunications plant cannot be easily reused when demand in one area (or for a particular service) declines and (2) costs do not vary in a simple proportional fashion as capacity grows or declines. With regard to demand, the apparent ETI view that only minimal services served by standard technology are legitimate concerns for regulators ignore the facts that (1) customers demand such services as second lines and prices for these and other services must be compensatory, (2) advanced technology reduces costs and improves service as well as provides a platform for new services, and (3) public policy can require even greater deployment of such technology, e.g., high speed access to the Internet by schools and libraries.

A. The ETI Vintage Analysis is Irrelevant

ETI argues that (1) because price caps for interstate services were instituted in 1990 and (2) the majority of ILEC net plant is attributable to investments made after that period, the ILECs are fully at risk for any losses that might occur henceforward.[1] The conclusion does not follow from the premises given and is based on an incomplete picture of the nature and extent of price cap regulation during the 1990s.

First, while price caps for interstate services did commence in 1990 and a clear majority of states now have price regulation plans for intrastate services, the latter development is rather recent. Price cap regulation at the state level accelerated considerably after 1994. Therefore, the regulatory bargain implicit in price caps applied to less than the full range of ILEC services (which the investment considered in the ETI report was made to provide).

More importantly, ETI's description of the regulatory bargain is an inaccurate caricature. The bulk of ILEC services were pervasively regulated throughout the 1990s. Price cap regulation, including the FCC's regulation of interstate prices, starts with the premise that prices at the start of price caps are cost-based. From this starting point, price regulation provides a path of future price ceilings that provide the continuing expectation that investors can earn a fair return. Between 1990 and the present, this expectation was coupled with prices that were designed to decline by about three to five percent per year in real terms. In contrast, AT&T's desire for access prices to decline by 90 percent in short order is a vast change from the prices anticipated from continuing application of the price cap program.[2]

The claim that the majority of plant is of recent vintage also appears to be inconsistent with the AT&T-sponsored Hatfield model of unbundled network element costs.[3] That model

---

[1] I note in passing that the use of net plant as a measure of investment understates the physical amount of pre-1990 plant being used. For example, for GTE, post-1990 *gross* investment is only about 40 percent of total investment.

[2] Indeed, compared to the huge price reductions proponents of TELRIC pricing are demanding, the changes to the price cap plan in 1995 and even the most extreme changes proposed last year are quite small.

[3] Hatfield Associates, Inc., *Hatfield Model, Version 2.2, Release 2*, September 4, 1996. Elsewhere, my colleagues and I have demonstrated that the various versions of the Hatfield model provide unrealistically low estimates of

purportedly provides sufficient capacity to meet *current* demands for lines and network usage.[4] Further, the model places switches in existing wire center locations. One might expect that a model designed to accommodate current demand levels using technology of a similar vintage would have similar levels of investment for switching. In fact, the Hatfield model typically provides for less than one-half the investment in switching that ILECs currently have, even for companies that are fully digital, consistent with the Hatfield model's forward-looking technology.[5]

This difference in investment levels for technology of similar vintage has one of two explanations. First, the Hatfield model's investment levels are unrealistically low. Second, current prices have not provided sufficient recovery of economic depreciation. In either case, basing prices on Hatfield model investment levels would deny ILEC investors a fair opportunity to earn a return on, and of legitimately invested capital.

B. ETI's Composition Analysis is Irrelevant and Inconsistent with Previous Positions

ETI's second study of the embedded plant reports that while the majority of total net investment is of post-1990 vintages, the bulk of investments for the "low tech" categories of metallic cable, buildings, conduit, and poles are of pre-1990 vintage. And since the replacement value of that plant exceeds the book value (because such investments are not subject to the productivity gains of "high tech" equipment such as switches and fiber electronics), their economic value is greater than book value. As I discussed earlier, whether technology is old or new has nothing to do with whether an unfulfilled obligation to recover that investment exists. Further, if ETI were correct on this score, a proper TELRIC study

---

the costs of unbundled network elements. Therefore, comparisons with this model should not be viewed as an endorsement of its validity; rather such comparisons illustrate the opportunistically selective use of arguments and methods by the ETI authors and their client.

[4] In particular, the model is supposed to accommodate all the lines and usage associated with the second lines that ETI apparently believes have been uneconomically provisioned.

would produce costs higher than embedded costs for elements and services using these investments, e.g., local loops. Accordingly, economically efficient prices for such elements and/or services would be *higher* in response to their greater economic value.

Again, the AT&T Hatfield model is inconsistent with the ETI conjecture. Not only are Hatfield loop costs on the order of 50 percent of embedded (and ILEC-sponsored TELRIC costs), total investment in the four categories falls considerably short of embedded levels.[6] In light of (1) the Hatfield model's claim that its loop plant serves current customer locations with technology that has been around for years and (2) ETI's claim that the economic value of such plant exceeds its book value, AT&T's attempt to acquire unbundled loops at prices below embedded costs is totally unsupported.

C. ETI's Analysis of Spare Capacity is Flawed and has Incredible Implications

ETI's third study of the embedded plant (utilization analysis) purports to demonstrate that much of post-1990 investment increased spare capacity rather than served demand growth. This conclusion is based on an aggregate analysis of growth and capacity additions, which for the most part ignores the fact that telephone plant is not fungible between locations.[7]

A simple example illustrates the problem. Suppose an ILEC served eleven areas, one large area (say 100,000 lines) that was growing at 10 percent per year and the others smaller (10,000 lines) declining at one percent per year. Overall, the ILEC's demand would be steady. The ETI analysis erroneously assumes that capacity freed up by the decline in the smaller areas

---

[5] It is somewhat curious that ETI questions the economic justification for the transition from analog to digital switching at the same time the Hatfield model (quite correctly) designates digital switching as the forward-looking technology.

[6] For example, for GTE in Texas, the Hatfield model produces investment of only 56 percent of book value for the four "low tech" categories.

[7] A similar problem arises with ETI's claim that unused building space can be used for other purposes. In the real world, constraints such as zoning restrictions and accessible buildings requirements can make such reuse of space costly and/or not feasible.

could be redeployed to accommodate the growth in the large area.[8] In fact, such capacity is not fungible.[9]

The authors also employ a simplistic and incorrect relationship between the cost of additional capacity and the amount of capacity, i.e., each unit of capacity increases cost by the same amount.[10] In reality, costs do not behave in such a simple fashion. Typically, initial units of capacity are expensive (e.g., the central processing unit in switches and the structure costs for loop plant). Additions beyond the initial capacity increment are less costly. Accordingly, even if ETI were correct in its claim that excess capacity exists, their simplistic cost reductions greatly overstate the costs of any such excess capacity.

A proper analysis of the amount of capacity needed to accommodate demand growth would, therefore, need to be conducted at a level of aggregation much smaller than a total ILEC and would have to employ a realistic model of how costs increase with additional capacity. That the ETI analysis is totally meaningless can be inferred from data presented in its own Tables. Table B-1 shows that RBOC net plant in 1996 was about $120 billion, which is virtually unchanged from 1989.[11] If ETI's claims about over investment in spare capacity were valid, the 1996 net plant would have been $30 million lower, which is 25 percent lower than the actual 1996 value. Yet, demand levels were approximately 25 percent higher.[12]

---

[8] ETI acknowledges that plant is not totally fungible by allowing 10 percent of an ILEC's actual additions when aggregate growth is lower or negative. No support for this adjustment is provided.

[9] Dr. Robert Mercer, the Hatfield model's chief expert, commented on the fungibility of loop plant as follows. "Q. Is it your understanding based on telephone plant engineering that the last mile of the distribution plant is movable and can be relocated from one location to another? A. In a hurricane perhaps, but not as a routine. You don't normally remove distribution facilities and put them somewhere else." Oral Deposition of Robert A. Mercer, Before the Texas Public Utility Commission, Docket Nos, 16226 and 16285, September 9, 1996, p. 158.

[10] Yet another example of the author's unrealistic view of spare capacity provisioning is their use of distribution fill factors of over 80 percent. Such fill factors imply minimal spare capacity and are considerably higher than even those used in the AT&T-sponsored Hatfield model, which themselves provide for inadequate spare capacity.

[11] Statistics of Communications Common Carriers, Table 2.9. The pattern of essentially constant net plant also describes GTE.

[12] Christensen Associates, "Total Factor Productivity Methods for Local Exchange Carrier Price Cap Plans," Submitted to the FCC, January 1996. The 3.3 percent post-1989 annual output growth rate, extrapolated to 1996, produces total growth of 26 percent.

III. REVENUE OPPORTUNITIES

A. "New" Sources of Revenue

ETI totals revenues from five non-basic service categories: (1) second lines, (2) vertical services, (3) interLATA long distance, (4) broadband, and (5) yellow pages. The authors appear to believe that the total of about $20 to $30 billion annually somehow offsets the loss in *contribution* ILECs will experience from TELRIC-based access charges and competitive inroads to local exchange markets. While the total is commensurate with current carrier access revenues, the similarity of current revenues reveals very little about the *changes* in incremental profits (change in revenue less change in costs) that would result from access charge reform and the evolution of competition in various markets.

With regard to carrier access charges, AT&T's position is quite clear. A reduction in prices to TELRIC would cause revenues (and profits) to decline by about 90 percent, or by at least $15 billion. In addition, new local exchange entrants, AT&T included,[13] intend to compete vigorously for the ILEC's current customers—very likely starting with the most lucrative of such customers.

In order to perform a similar assessment of ETI's alleged new revenue sources, a similar projection of *changes* in revenues and costs is necessary.

1. Second lines

Unlike carrier access services, there is relatively little (or no) contribution in subscriber line rates. Indeed, current residential basic service rates are often lower than reported incremental costs of local loops. Therefore, as volumes expand, the amount of incremental profit is considerably lower than the incremental revenue (and likely to be even lower than the current revenue base).

[13] Indeed, AT&T has announced its expectation of capturing at least one-third of the local exchange market on several occasions.

2. Vertical services

ETI's analysis of vertical services, while correct in pointing out that current prices contain high margins over cost, ignores the fact that the FCC's Interconnection Order requires vertical features to be bundled with the local switching platform. Therefore, entrants using unbundled elements will be well-positioned to put downward pressure on prices. As a result, rather than being a source of new revenues (and profits), vertical features could experience revenue (and profit) erosion akin to that anticipated for carrier access.

3. InterLATA long distance

Unlike the previous revenue categories, interLATA revenues would be a new source for the ILECs (at least the RBOCs). There are a couple of ironies here, however. First, while AT&T's consultants include such revenues as a potential offset to lost carrier access contribution, history suggests that the Company will inhibit the ILEC's regulatory efforts to gain interLATA authority when the time comes. Second, AT&T's standard argument that this market is strongly competitive implies that firms in this market can expect only normal profits. By definition such profits cover bare economic costs, leaving no additional funds to mitigate the lost *contribution* in carrier access services.

4. Broadband

Again, the broadband revenues would be additions to current revenues. However, considerable investment in broadband facilities would be required to realize these revenues. In fact, the ETI authors routinely opposed ILEC video dialtone applications, in part based on the contention that LEC revenue estimates were inflated and reductions to more realistic levels would make the investment uneconomic, i.e., costs would exceed revenues.[14] In point of fact, ILECs have generally scaled back their video initiatives, perhaps in response to the difficulty of

[14] See, for example, Declaration of Patricia D. Kravtin regarding Pacific Bell's video dialtone application, filed with the Federal Communications Commission, February 14, 1994. Interestingly, in direct contradiction to ETI's analysis of spare capacity in this proceeding, which claims that ILECs have been over investing since 1990, Ms. Kravtin claimed in 1994 that Pacific was *disinvesting* in its network.

gaining regulatory approval, the difficulty of which was likely increased by the active opposition of ETI's clients.

5. Yellow pages

ETI merely lists yellow pages revenue. There is no claim that revenue, let alone contribution, from this source is likely to grow contemporaneously with the loss of carrier access contribution that AT&T seeks to facilitate.

B. Other Financial Indicators

The ETI reports that the market to book ratios for LECs are in the two to three range, well above a ratio of unity. Form this they conclude that (1) ILECs have substantial market power and/or (2) they have unique new revenue opportunities. Time does not permit a detailed evaluation of these figures. However, to put these ratios into context, AT&T's current market to book ratio is also greater than two. Yet, AT&T has strenuously argued that it has no market power. According to ETI's reasoning, AT&T evidently also enjoys unique revenue opportunities. Alternatively (and more likely), the market/book ratio is a seriously flawed indicator of anything useful.

ETI also mentions an apparent increase in Pacific's stock price after the proposed merger with SBC was announced. Others have noted that when the combined values of Pacific and SBC are considered, no increase to shareholders was apparent—yet another example of ETI's selective use of partial information.[15]

IV. Conclusion

The ETI report presents a plethora of seemingly large numbers used to justify AT&T's demand for major access charge reductions. None of the figures are at all relevant in establishing what the report claims to establish—that regulators are relieved of their responsibility to provide a continuing opportunity to recover legitimately-incurred costs. Not only is the information irrelevant, but in the case of their attempt to define and quantify excess

[15] Rebuttal Testimony of Joseph A. Grundfest, on Behalf of Pacific Bell, Before the California Public Utilities Commission, Application No. 96-04-038, October 15, 1996.

capacity, the authors' calculations exhibit a lack of understanding of telecommunications costs and are fundamentally flawed as a result.

Timothy J. Tardiff

Subscribed and sworn before me this 14th day of February 1997.

Notary Public

My commission expires September 18, 2003.

APPENDIX B

NATIONAL ECONOMIC
RESEARCH ASSOCIATES
555 S. FLOWER STREET, LOS ANGELES, CALIFORNIA 90071
TEL: *213.628.0131* FAX: *213.628.9368*

nera
Consulting Economists

THE PRODUCTIVITY FACTOR IN THE LEC PRICE CAP FORMULA SHOULD REFLECT ACHIEVABLE PRODUCTIVITY GAINS

Affidavit of Gregory M. Duncan

Prepared for GTE

February 14, 1997

I. INTRODUCTION

In its 1996 comments, GTE proposed an adjustment to the Price Cap Index (PCI) based on an overriding principle: that the PCI be calculated in such a way as to mimic the price behavior that would be expected in a competitive industry. Specifically, that it be based on the difference between Local Exchange Carrier (LEC) input price growth and LEC Total Factor Productivity (TFP), which GTE referred to as the direct method, and second that it be adjusted on a forward-looking basis, using optimal forecasting techniques, to reflect the next-year's conditions, not past conditions.

I have reviewed the comments of Christensen and Associates on behalf of USTA and find them compelling. I heartily endorse the Christensen method of computing TFP: it is simple, based on publicly available data, and uses the best possible methodology since the accurate computation of TFP is a key component (if not the key component) in any PCI adjustment proposal.

I also have reviewed the comments of AT&T and its consultant John Norsworthy, and the comments of MCI and find them both in error. Dr. Norsworthy's method is based on a serious conceptual error: he, erroneously, claims that it is possible to compute output specific TFPs, in Norsworthy's case an interstate only measure. In fact, it is well known that such a separation is possible only when there are no joint and common costs. Whereas MCI's proposal is not a price cap proposal at all but instead a price control, *a la* the discredited gasoline price controls of the 1970s that produced long gas lines and no new gas until they were removed.

II. THE PCI SHOULD BE BASED ON THE DIRECT METHOD AND OPTIMAL FORECASTING TECHNIQUES

The idea of price cap regulation is to cap the prices of a basket of output prices that changes over time in a fashion consistent with the way an otherwise identical competitive market would constrain those prices. This means, among other things, being able to adjust the PCI on a going forward basis to meet or anticipate the next-year's conditions in exactly the same way firms in a competitive market would.

Practically, the first step is the calculation of the PCI adjustment term as the deviation between input price growth and TFP, and second to use an optimal forecast of the PCI adjustment factor as the best forward looking estimate of the price adjustment that might be expected if the industry were indeed competitive.

The economically correct approach to calculating a PCI adjustment term is the direct method,

$$\% \Delta \text{ (LEC input prices)} - \% \Delta \text{ (LEC TFP)}.$$

A nearly equivalent approach uses the FCC's current formula,

$$\% \Delta GDPPI - (\% \Delta TFP_{LEC} - \% \Delta TFP_{US}).$$

The FCC's current formula is an approximation to the direct method. It uses an assumption that the changes in the US input price series, as measured by $(\% \Delta GDPPI + \% \Delta TFP_{US})$, is a good proxy for the LEC input price series and less volatile. The Commission originally selected the current formula as an acceptable LEC input price series did not exist at that time

which could be used in a direct method, a methodology that was and is in use by the Interstate Commerce Commission for the railroad industry. The Christensen methodology now produces an acceptable input price series that could be used in a direct method.

I prefer to base the PCI adjustment factor on the direct method. However, properly applied, by means of a forward-looking forecast, the Commission's formula and the direct method should produce the same result. Specifically, I recommend that the PCI adjustment term be the next-year optimal forecast of the deviation between the percentage changes in LEC input prices and the percentage change in LEC TFP,

$$\% \Delta \text{ LEC input prices} - \% \Delta \text{ LEC TFP}.$$

This method mimics exactly the workings of a competitive market experiencing technological change[1]. In such a market, firms in the industry would forecast the input and output prices and plan their production accordingly. Naturally, the survivors over the long run are those that would use optimal forecasts. Thus an optimally forecasted PCI provides exactly the same signals and in doing so mimics the workings of a competitive market. Using optimal forecasting methods has other desirable consequences. First, optimal forecasting is not a matter of debate; a textbook time series analysis and forecast are all that are needed. Second, using the Christensen method for calculating TFP, which produces as a byproduct a LEC input price series, an optimal forecast could be readily produced and carried out beyond a one-year period for a preview of subsequent year's changes in the PCI. Moreover, optimal time series forecasts

[1] *See* Appendix A.

have the additional beneficial property that they, by their nature, smooth volatility.[2] Finally, they should give similar forecasts whether applied to the FCC formula or the direct formula. The recent proposals by some parties for "correcting" the FCC formula for possible input price differentials introduce unnecessary complications to the formula as doing so is simply an attempt to approximate the result that a direct method would produce and, therefore, need not be approximated.

AT&T, MCI and Ad Hoc claim that the X-factor in the PCI adjustment should be increased although for different reasons. AT&T resurrects the thoroughly discredited study by its consultant Norsworthy, while MCI attempts to change price cap regulation into price control regulation of the type that gave long gas lines during the gasoline price control days of the 1970's.

III. RESPONSE TO AT&T

The primary conceptual flaw in the AT&T/Norsworthy study is the claim that interstate and intrastate productivity can be meaningfully measured. This is simply untrue, and was completely rebutted by Christensen *et al* in USTA's March 1, 1996, reply comments.[3] When outputs share facilities and when there are joint and common costs, it is simply impossible to define separate total factor productivities. Any claim at doing so will be found to have at its root arbitrary and meaningless, though by no means harmless, cost allocations. This flaw is so egregious that the study must be thrown out without further comment. I note that, properly

[2] *See* Appendix B.

done, the Norsworthy method could be used to calculate a total company factor. However, I concur with the Christensen analysis that other serious errors that attend the Norsworthy study need to be corrected first. While I have not replicated Christensen's correction of Norsworthy, I find their analysis persuasive and agree that once the errors in the Norsworthy paper are corrected, and a total company productivity factor calculated, the Norsworthy analysis supports the Christensen analysis, albeit with a great deal more effort.

IV. REPLY TO MCI

MCI's comments seem to have less to do with mimicking competition than wishing to set prices in lieu of competition. Put in its best light, MCI presents a prescription for price control regulation rather than price cap regulation. MCI would have the Commission compute an estimate of the eventual market equilibrium price, and then set the PCI to nearly immediately fall to that price. This is the kind of thinking that went into the discredited price controls on gasoline that caused such long lines in the 1970s. And one needs only to remember those long lines to see the likely consequences of such a methodology applied to telecommunications. In brief, setting prices at their eventual long run resting place, if lower than current prices, will cause shortages in services. The reason is simple. If the price of output falls, presumably demand will increase and handling the new demand will require investment in new facilities. If the price is set to TELRIC or near TELRIC, an incumbent firm

---

(...continued)

[3] "Reply Comments of the United States Telephone Association on the Fourth Further Notice of Proposed Rulemaking" CC-Docket No. 94-1, March 1, 1996

cannot cover any joint or common costs and consequently will have no incentive to increase capacity. Similarly, a potential entrant will not be able to charge a price higher than the direct short run operating cost of providing service and so, if it entered, would not be able to cover its startup costs nor its joint and common costs. Consequently, there will be no new entrants nor will incumbents expand capacity to accommodate the new service. The result is a textbook shortage caused by too low a price ceiling.[4] Invariably, shortages are rationed by non-price methods. For example, preference is given to one customer rather than another.

For the market to work, the price must stay up long enough for new firms to enter, enjoy some quasi-rents to pay off their investments, and to engage in the competition that will drive the price down. Attempts to shortcut this process have always failed and will always fail.

Other significant practical problems attend attempts to take such market shortcuts. The eventual market price must be estimated. MCI would use TELRIC pricing as estimated by its Hatfield model, which is the source of great skepticism and controversy. In addition, as the Commission well knows, a pure TELRIC standard is appropriate only if there are no joint and common costs. This is not an area where the FCC should replace a fairly well agreed to and well understood policy with a controversial one.

V. CONCLUSION

The correct method to determine the price cap index adjustment is by means of an optimal forecast of the PCI adjustment factor. The TFP methodology proposed by Christensen

[4] A formal analysis can be found in many textbooks, I provide a simple graphical analysis in Appendix C.

and Associates is the only valid choice available to the FCC as it uses correct assumptions and produces both a TFP and an input price series for the LEC industry. AT&T's proposal is based on errors and, when corrected, give nearly the same result as Christensen. MCI's proposal has nothing to do with measuring productivity, but is instead an attempt to turn back the clock and replace price cap regulation with the price control regulation of the 1970s.

APPENDIX A

THE APPROPRIATE MEASURE FOR A PCI ADJUSTMENT FACTOR IS THE GROWTH OF LEC INPUT PRICES MINUS THE RATE OF GROWTH OF LEC TFP.

Under competition, a properly weighted index of output price changes equals the difference of a properly weighted index of input price changes minus the rate of change of total factor productivity.

Let $p_j(t)$ indicate output prices at time t, let $q_j(t)$ indicate output levels, let $w_i(t)$ indicate input prices and let $x_i(t)$ be input levels, and let

$$C(t) = C(q_1(t),\cdots,q_I(t),w_1(t),\cdots w_J(t),t)$$

be a cost function depending on outputs, input prices, and time. In competition, there is a zero profit condition that total revenue equals total cost that holds identically; *e.g.*,

$$\sum_{i=1}^{I} p_i(t)q_i(t) \equiv C(q_1(t),\cdots,q_I(t),w_1(t),\cdots w_J(t),t)$$

or

$$R(t)=C(t);$$

differentiating with respect to time gives:

$$\begin{aligned}\sum_{i=1}^{I} p_i(t)\dot{q}_i(t) + \dot{p}_i(t)q_i(t) \equiv & \sum_{i=1}^{I} C_i\left(q_1(t),\cdots,q_I(t),w_1(t),\cdots,w_J(t),t\right)\dot{q}_i(t) \\ & + \sum_{j=1}^{J} C_j\left(q_1(t),\cdots,q_I(t),w_1(t),\cdots,w_J(t),t\right)\dot{w}_i(t) \\ & + C_t\left(q_1(t),\cdots,q_I(t),w_1(t),\cdots,w_J(t),t\right)\end{aligned}$$